

## ASSIGNMENT 2

Textbook Assignment: "Navigation," chapter 2, pages 2-1 through 2-19.

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- 2-1. Which of the following Instrument(s) invention in the early 1700s made accurate navigation possible, even when far away from land?
1. Astrolabe
  2. Sextant only
  3. Chronometer only
  4. Sextant and chronometer
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IN ANSWERING QUESTIONS 2-2 THROUGH 2-5, SELECT THE NAVIGATION TERM FROM COLUMN B THAT IS DEFINED BY THE NAVIGATION DEFINITION IN COLUMN A.

A. DEFINITIONS	B. TERMS
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|---|---|
| 2-2. Position of one point In space relative to another point without reference to distance | 1. Position<br>2. Direction<br>3. Distance<br>4. Time |
| 2-3. A point defined by stated or implied coordinates                                       |   |
| 2-4. An elapsed interval  |   |
| 2-5. Separation of two points, measured by the length of the line joining them              |   |
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- 2-6. What distance is the approximate difference between the highest point and lowest point on the earth's crust?
1. 10 miles
  2. 12 miles
  3. 15 miles
  4. 18 miles

- 2-7. In reference to the earth's size and shape, which of the following conditions best describes the term ellipticity of the earth?
1. The diameter of the earth measured around the equator (6,887.91 nmi)
  2. The diameter of the earth measured through the poles (6864.57 nmi)
  3. The ratio between the equatorial and polar diameters (.9966 to 1)
  4. The difference between the diameters around the equator and through the poles (23.34 nmi)

- 2-8. The arc of a great circle is the shortest distance between two points on a plane.

1. True
2. False

- 2-9. How many sections is a meridian divided into by the equator and the poles?

1. Six
2. Two
3. Eight
4. Four

- 2-10. The arbitrary starting point for longitude is identified by which of the following terms?

1. Greenwich or zero meridian only
2. Prime or zero meridian only
3. First or prime meridian only
4. Greenwich, zero, prime, or first meridian

- 2-11. Which of the following are the subdivisions of a degree of arc?
1. Minutes and seconds, or minutes and tenths of minutes
  2. Hours, seconds, and tenths of seconds
  3. Hours, minutes, and seconds
  4. Hours, minutes, and tenths of minutes
- 2-12. Which of the following is the nautical miles to statute miles conversion ratio?
1. 6,000 ft = 1 statute mile
  2. 1.15 nautical mile = 1 statute mile
  3. 1.15 statute mile = 1 nautical mile
  4. 5,280 ft = 1 nautical mile
- 2-13. A speed of 500 knots and a speed of 500 nautical miles per hour are equivalent.
1. True
  2. False

IN ANSWERING QUESTIONS 2-14 AND 2-15,  
REFER TO FIGURE 2-5 IN THE TEXTBOOK.

- 2-14. What circle represents the horizon divided into 360 degrees?
1. Compass gyro
  2. Wet compass
  3. Compass rose
  4. Magnetic compass
- 2-15. What is the true heading of the aircraft?
1. 000 degree
  2. 062 degrees
  3. 110 degrees
  4. 295 degrees

IN ANSWERING QUESTIONS 2-16 AND 2-17,  
REFER TO FIGURE 2-6 IN THE TEXTBOOK.

- 2-16. If the true heading of the aircraft shown is changed to 225 degrees, what is the true bearing to the island?
1. 045 degrees
  2. 090 degrees
  3. 180 degrees
  4. 225 degrees
- 2-17. If the true heading of the aircraft shown is changed to 225 degrees, what is the relative bearing to the island?
1. 045 degrees
  2. 090 degrees
  3. 180 degrees
  4. 225 degrees
- 2-18. What type of navigation uses only speed and heading measurements to compute position changes from an initial position fix?
1. Inertial
  2. Dead reckoning
  3. Magnetic
  4. Doppler
- 2-19. World War II fostered the development of which of the following radio aids?
1. Doppler
  2. TACAN
  3. Omega
  4. Loran
- 2-20. Altitude is defined as the horizontal distance of a level, a point, or an object measured from a given point.
1. True
  2. False
- 2-21. Every aircraft has what type of altimeter?
1. Pressure
  2. Laser
  3. Radar
  4. Absolute

IN ANSWERING QUESTIONS 2-22 THROUGH 2-28,  
SELECT FROM THE FOLLOWING LIST THE TERM  
DESCRIBED IN THE QUESTION.

- A. Absolute altitude
- B. Calibrated altitude
- C. Density altitude
- D. Indicated altitude
- E. Pressure altitude
- F. True altitude
- G. Standard datum plane

2-22. The zero-elevation level of an  
Imaginary atmosphere known as the  
standard atmosphere

- 1. A
- 2. C
- 3. E
- 4. G

2-23. The value of altitude that is  
displayed on the pressure altimeter

- 1. A
- 2. B
- 3. D
- 4. F

2-24. Indicated altitude corrected for  
installation/position error

- 1. B
- 2. D
- 3. E
- 4. F

2-25. The height above the standard datum  
plane

- 1. A
- 2. C
- 3. E
- 4. G

2-26. Pressure altitude corrected for  
temperature

- 1. B
- 2. C
- 3. E
- 4. F

2-27. The actual vertical distance above  
mean sea level

- 1. B
- 2. D
- 3. E
- 4. F

2-28. The height above the terrain

- 1. A
- 2. C
- 3. E
- 4. G

IN ANSWERING QUESTION 2-29, REFER TO  
FIGURE 2-7 IN THE TEXTBOOK.

2-29. At standard pressure, how many  
inches of mercury are equal to  
670.2 millibars?

- 1. 17.58
- 2. 19.79
- 3. 20.58
- 4. 29.92

2-30. What type of altitude is indicated  
on the pressure altimeter?

- 1. Absolute altitude
- 2. Calibrated altitude
- 3. Density altitude
- 4. Indicated altitude

2-31. What part of the reference plane is  
indicated on the barometric scale  
of the pressure altimeter?

- 1. The barometric pressure (in.Hg)
- 2. The barometric pressure  
(millibars)
- 3. The standard temperature (°C)
- 4. The standard temperature (°F)

2-32. Which of the following types of  
pressure altimeters is/are used in  
aircraft?

- 1. Counter-drum only
- 2. Counter-pointer only
- 3. Counter-drum-pointer only
- 4. Counter-drum-pointer and  
counter-pointer

2-33. What increments in feet, from 0 to 80,000, does the counter-pointer altimeter two-digit display indicate?

1. 100
2. 500
3. 1,000
4. 10,000

2-34. Misinterpreting altitude by 1,000 feet immediately before or after the 1,000-foot counter moves is a problem with which of the following types of pressure altimeters?

1. Counter-drum only
2. Counter-pointer only
3. Counter-drum-pointer only
4. Counter-drum-pointer and counter-pointer

2-35. Misinterpreting altitude by 1,000 feet immediately before and after the 1,000-foot counter moves is prevented by which of the following types of altimeters?

1. Counter-drum only
2. Counter-pointer only
3. Counter-drum-pointer only
4. Counter-drum-pointer and counter-pointer

2-36. What mode of operation of the counter-drum-pointer altimeter uses static pressure from the static system that is NOT corrected for position error?

1. Standby
2. Servoed
3. Code
4. Decode

2-37. If electrical power is lost to the counter-drum-pointer altimeter, the altimeter automatically switches to what mode of operation?

1. Standby
2. Servoed
3. Code
4. Decode

IN ANSWERING QUESTIONS 2-38 THROUGH 2-42, SELECT FROM THE FOLLOWING LIST THE TYPE OF PRESSURE ALTIMETER ERROR DESCRIBED IN THE QUESTION.

- A. Mechanical
- B. Scale
- C. Installation/position
- D. Reversal
- E. Hysteresis

2-38. The lag in the altitude indication due to the elastic properties of the materials within the altimeter

1. A
2. B
3. D
4. E

2-39. A momentary indication in the opposite direction

1. A
2. B
3. D
4. E

2-40. Caused by the airflow around the static ports

1. B
2. C
3. D
4. E

2-41. Caused by the irregular expansion of the aneroid cells

1. A
2. B
3. C
4. D

2-42. Caused by the misalignment in the gears and the levers

1. A
2. B
3. C
4. D

- 2-43. What method does the AN/APN-194(V) radar altimeter use to determine altitude?
1. Doppler shift
  2. Frequency change
  3. Time delay
  4. Signal strength
- 2-44. The control knob on the ID-1760A/APN-194(V) has which of the following functions?
1. Power switch only
  2. Self-test switch only
  3. Position control for the limit bug
  4. Power and self-test switch and position control for the limit bug
- 2-45. Locked at 550 feet, in what altitude mode is the RT-1042/APN-194(V) operating?
1. Search
  2. Track
  3. Low-level
  4. High-level
- 2-46. Locked at 2,500 feet, in what range mode is the RT-1042/APN-194(V) operating?
1. Search
  2. Track
  3. Low-level
  4. High-level
- 2-47. What component of the AN/APN-194(V) system provides isolation of the receiver from the transmit antenna?
1. BZ-157A
  2. RT-1042/APN-194(V)
  3. ID-1760A/APN-194(V)
  4. MX-9132A/APN-194(V)
- 2-48. What component in the EA-6A aircraft applies a 2-second tone alternating between 700 and 1,700 Hz at 2-Hz intervals to the Its?
1. BZ-157A
  2. RT-1042/APN-194(V)
  3. ID-1760A/APN-194(V)
  4. MZ-9132A/APN-194(V)
- 2-49. What altitude is the high-altitude index on the AN/APQ-107 system when installed in the P-3C aircraft?
1. 170 ( $\pm 20$ ) feet
  2. 380 ( $\pm 20$ ) feet
  3. 700 ( $\pm 20$ ) feet
  4. 830 ( $\pm 20$ ) feet
- 2-50. What altitude above takeoff altitude does the RAWS inhibit the radar altimeter reliability signal?
1. 170 feet
  2. 380 feet
  3. 700 feet
  4. 830 feet
- 2-51. What control on the C-6899/ARN-83 causes a tone to be produced for tuning purposes?
1. ADF switch
  2. LOOP switch
  3. ANT switch
  4. BFO switch
- 2-52. The loop antenna signals are mixed with the sense antenna signal in the R-1391/ARN-83 in what mode of operation?
1. ADF
  2. BFO
  3. LOOP
  4. ANTENNA
- 2-53. What mode of operation causes the R-1391/ARN-83 to act as a normal receiver?
1. ADF
  2. BFO
  3. LOOP
  4. ANTENNA

IN ANSWERING QUESTIONS 2-54 THROUGH 2-56,  
REFER TO FIGURE 2-12 IN THE TEXTBOOK.

- 2-54. What type of radiation pattern is generated by the parasitic antenna elements in the outer rotating cylinder of a typical TACAN station?
1. Nine-lobe for course bearing
  2. Nine-lobe for fine bearing
  3. Cardioid for course bearing
  4. Cardioid for fine bearing
- 2-55. What type of radiation pattern is generated by the parasitic antenna element in the inner rotating cylinder of a typical TACAN station?
1. Nine-lobe for course bearing
  2. Nine-lobe for fine bearing
  3. Cardioid for course bearing
  4. Cardioid for fine bearing
- 2-56. How many auxiliary reference bursts per revolution is/are there in the pattern from a typical TACAN station?
1. One
  2. Five
  3. Eight
  4. Nine
- 2-57. At what interval does the TACAN ground station identify itself by transmitting its call letters in Morse code?
1. 37.2 seconds
  2. 39.7 seconds
  3. 45.0 seconds
  4. 53.8 seconds
- 2-58. Which of the following items facilitate(s) calculation of slant range from the aircraft to the ground station?
1. Ground station bearing
  2. Ground station identity
  3. Time between ground station interrogation and aircraft reply
  4. Time between aircraft interrogation and ground station reply
- 2-59. Which of the following information is computed and/or processed in the RT-1022/ARN-84(V)?
1. Station bearing and slant range only
  2. Station bearing and identity only
  3. Station slant range and identity only
  4. Station bearing, slant range, and identity
- 2-60. Which of the following station information is provided by the AN/ARN-84 system in the receive mode?
1. Bearing and identity only
  2. Range and identity only
  3. Bearing and range only
  4. Bearing, range, and identity
- 2-61. Which of the following station information is provided by the AN/ARN-84 system in the T/R mode?
1. Bearing and identity only
  2. Range and identity only
  3. Bearing and range only
  4. Bearing, range, and identity
- 2-62. Two aircraft are using the A/A mode of operation. The first aircraft is on channel 23. On what channel is the second aircraft on?
1. 23
  2. 63
  3. 86
  4. 126
- 2-63. Which of the following indications will be seen if a fault is detected during interruptive self-test in the AN/ARN-84 system?
1. GO indicator till light on the control panel for 9 seconds
  2. NO-GO indicator will light on the control panel only
  3. NO-GO indicator will light on the RT only
  4. NO-GO indicators will light on the control panel and the RT

- 2-64. What distance is the maximum range to receive usable loran signals over water?
1. 2,000 miles
  2. 2,800 miles
  3. 3,000 miles
  4. 3,800 miles
- 2-65. What antenna is used to receive loran signals for the AN/ARN-83 system?
1. UHF1 top blade
  2. HF2 long-wire
  3. ADF sense
  4. VHF stub
- 2-66. The omega ground stations transmit on which of the following frequencies?
1. 10.0, 11.3, and 13.6 kHz
  2. 10.2, 11.3, and 13.6 kHz
  3. 10.2, 11.6, and 13.6 kHz
  4. 10.6, 11.3, and 13.2 kHz
- 2-67. Omega ground station(s) is/are deselected at what range(s)?
1. Less than 600 nmi only
  2. More than 7,200 nmi only
  3. Less than 600 nmi and more than 7,200 nmi
  4. Between 600 nmi and 7,200 nmi
- 2-68. After synchronization of the AN/ARN-99(V) omega system, what component controls the antenna selection?
1. Central computer
  2. Antenna coupler
  3. Control panel
  4. Receiver-converter
- 2-69. What section of the OR-90/ARN-99(V) enables test signals to be injected into the omega system?
1. Correlator
  2. Receiver
  3. Digital converter
  4. Discrete storage
- 2-70. What section in the OR-90/ARN-99(V) acts as an interface between the communication and the receiver sections?
1. Correlator
  2. Digital converter
  3. Discrete storage
  4. Power supply
- 2-71. The AN/APN-153(V) navigational set provides which of the following types of navigational information?
1. Airspeed and altitude
  2. Ground speed and drift angle
  3. Airspeed and drift angle
  4. Ground speed and altitude
- 2-72. What information is derived from the antenna azimuth position of the AN/APN-153(V) navigational set?
1. Altitude
  2. Airspeed
  3. Drift angle
  4. Ground speed
- 2-73. What component of the AN/APN-153(V) uses a magnetron power oscillator?
1. Receiver-transmitter
  2. Control indicator
  3. Central computer
  4. Antenna
- 2-74. What component of the AN/APN-153(V) contains the pitch and roll rotary couplers?
1. Receiver-transmitter
  2. Control indicator
  3. Central computer
  4. Antenna
- 2-75. On the C-4418A/APN-153(V) after the TEST position is selected on the mode switch, what is the delay time prior to proper test indications?
1. 1 minute
  2. 2 minutes
  3. 15 seconds
  4. 45 seconds